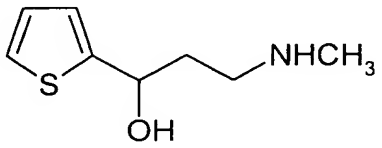
We claim:

1. A process for preparing 3-methylamino-1-(thien-2-yl)propan-1-ol of the formula I



(I)

wherein

a) thiophene is reacted with a β-halopropionyl halide or an acryloyl halide in the presence of a Lewis acid to give a 3-halo-1-(thien-2-yl)propan-1-one, with a hydrogen halide being passed in simultaneously or after the reaction has taken place, but before the reaction product is isolated, and

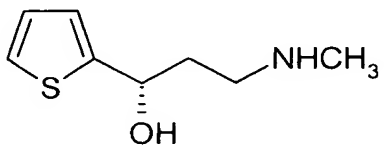
b) the propanone obtained in step a) is reduced and then, where appropriate without isolating the reaction product, reacted with methylamine.

2. A process as claimed in claim 1, wherein the Lewis acid used in step a) is aluminum trichloride.

3. A process as claimed in one of the preceding claims, wherein the reaction in step a) is carried out in a halogenated hydrocarbon as the solvent.

4. A process as claimed in one of the preceding claims, wherein the reduction in step b) is carried out using a metal hydride or semimetal hydride or using hydrogen in the presence of a transition metal catalyst as the reducing agent.

5. A process as claimed in one of the preceding claims for preparing (S)-3-methylamino-1-(thien-2-yl)propan-1-ol of the formula I-S



(I-S)

where appropriate in a mixture together with its R enantiomer I-R, with the propanol of the formula I-S predominating in the mixture, wherein the reduction in step b) is carried out in the presence of a chiral reducing agent or a chiral catalyst which exhibit selectivity with regard to the formation of (S)-3-methylamino-1-(thien-2-yl)propan-1-ol.

6. A process as claimed in claim 5, wherein the reducing agent used in step b) is an asymmetric metal hydride or semimetal hydride or hydrogen in the presence of an asymmetric transition metal catalyst or wherein the reduction is carried out in the presence of a compound which mediates asymmetric induction.

7. A process as claimed in claim 5, wherein the reduction in step b) is carried out in the presence of a dehydrogenase (E.C. 1.1.x.x.).

8. A process as claimed in claim 7, wherein the reduction is carried out in the presence of a dehydrogenase (E.C. 1.1.1.x), in particular in the presence of an alcohol dehydrogenase (E.C.1.1.1.1 or E.C.1.1.1.2).

9. A process as claimed in claim 7 or 8, wherein the dehydrogenase is selected from among dehydrogenases from yeasts of the genus Geotrichum, Pichia, Candida, Hansenula or Saccharomyces and from bacteria of the genus Pseudomonas, Burkholderia, Agrobacterium, Rhodococcus or Lactobacillus.

10. A process as claimed in claim 9, wherein the dehydrogenase is selected from among dehydrogenases from Geotrichum candidum, Candida magnoliae and Lactobacillus brevis.

11. An alcohol dehydrogenase having an amino acid sequence which, in the region of the N terminus
    a) comprises a constituent amino acid sequence of at least 10 consecutive *amino acid residues* as depicted in SEQ ID NO: 1, with the position corrresponding to amino acid position 12 as depicted in SEQ ID NO:1 preferably additionally standing for valine; or a
    b) constituent amino acid sequence of at least 10 consecutive *amino acid residues* as depicted in SEQ ID NO: 2;

    and also the functionally equivalent alcohol dehydrogenases which are derived therefrom.

12. An alcohol dehydrogenase as claimed in claim 11 which is capable of reducing 3-chloro-1-(thien-2-yl)propan-1-one to (S)-3-chloro-1-(thien-2-yl)propan-1-ol.

13. An alcohol dehydrogenase as claimed in claim 12 which catalyzes the reduction in an enantiomeric purity of at least 85% ee (in the presence of NADH and/or NADPH; at 30°C and pH 6.0).

14. An alcohol dehydrogenase as claimed in one of claims 11 to 13 which is encoded by a nucleic acid sequence comprising SEQ ID NO:3 or which comprises an amino acid sequence as depicted in SEQ ID NO: 4 or at least a constituent sequence as depicted in Figure 3, and can preferably be obtained from Lactobacillus brevis; and also the functionally equivalent alcohol dehydrogenases which are derived therefrom.

15. An alcohol dehydrogenase as claimed in one of claims 11 to 13 which is encoded by a nucleic acid sequence comprising SEQ ID NO:5 or which possesses an amino acid sequence comprising SEQ ID NO: 6 and can preferably be obtained from Candida magnoliae (ATCC 12573); and also the functionally equivalent alcohol dehydrogenases which are derived therefrom.

16. A nucleic acid sequence which comprises the coding sequence for the dehydrogenase as claimed in one of claims 11 to 15, in particular as depicted in SEQ ID NO: 3 and 5; and also the derivatives which are derived therefrom.

17. An expression cassette which comprises a nucleic acid sequence as claimed in claim 15 in operative linkage with at least one regulatory nucleic acid sequence.

18. A recombinant vector which comprises at least one expression cassette as claimed in claim 16.

19. A prokaryotic or eukaryotic host which is transformed with at least one vector as claimed in claim 17.

20. The use of the dehydrogenase as claimed in one of claims 11 to 14, or of a natural or recombinant microorganism which produces this dehydrogenase, for preparing (S)-3-halo-1-(thien-2-yl)propan-1-ol.

21. A process as claimed in one of claims 7 to 10, wherein the dehydrogenase employed is the alcohol dehydrogenase as claimed in one of claims 11 to 14 or a natural or recombinant microorganism which produces this dehydrogenase.

22. A process for preparing (S)-3-methylamino-1-(thien-2-yl)propan-1-ol of the formula I-S in which a 3-halo-1-(thien-2-yl)propan-1-one is reduced enantioselectively, wherein the reduction is effected in the presence of a dehydrogenase.

23. A process as claimed in claim 21, wherein the (S)-3-halo-1-(thien-2-yl)propan-1-ol which is obtained in the reduction is reacted with methylamine without being isolated.

24. A process as claimed in claim 21 or 22, wherein the dehydrogenase is selected from among dehydrogenases from yeasts of the genus Geotrichum, Pichia, Candida, Hansenula or Saccharomyces and from bacteria of the genus Pseudomonas, Burkholderia, Agrobacterium, Rhodococcus or Lactobacillus.

25. A process as claimed in claim 23, wherein the dehydrogenase is selected from among dehydrogenases from Geotrichum candidum, Candida magnoliae or Lactobacillus brevis.

26. A process as claimed in claim 21, wherein the dehydrogenase is selected from among alcohol dehydrogenases as claimed in one of claims 11 to 15.

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